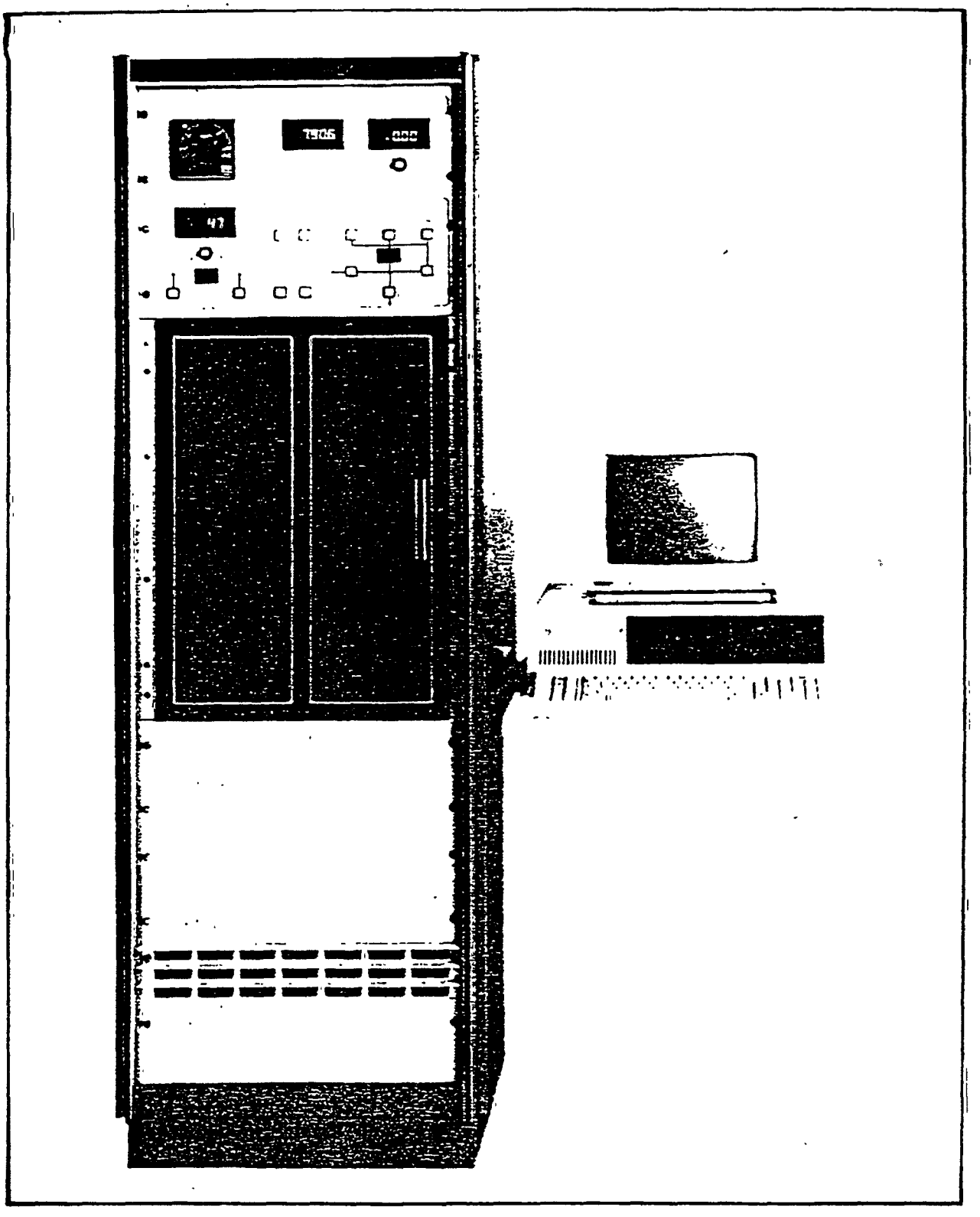

OMNISORP 100CX CHEMISORPTION SURFACE AREA AND PORE SIZE ANALYZER

OMICRON TECHNOLOGY CORPORATION

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OMNISORP™-100CX ANALYZER

SYSTEM DESCRIPTION

SUMMARY DESCRIPTION

The Omnisorp™-100CX Analyzer is a fully computerized and automated double port instrument for determining both physisorption and chemisorption isotherms. One port is dedicated to physisorption work for precision characterizations of surface area and pore size for powders and solids with pore sizes from 2 to 2000Å in radius. The second port is for chemisorption analysis for surface areas, monolayer capacities and dispersions. The instrument includes a programmable furnace for chemisorption outgassing, reduction and sorption experiments to 450°C and for the outgassing of physisorption samples. It can be lowered to allow fast cooling of the sample.

The chemisorption port is designed to permit the reduction of the sample in a flowing stream of hydrogen. Prior to a chemisorption experiment, the sample can be outgassed in situ at temperatures up to 450°C in vacuum, followed by hydrogen reduction, if required, under a high flow of hydrogen gas that provides excellent mass transfer to the catalyst particles.

The analysis of a sample is fully automated, with computer-driven experimental control. All data is reduced by highly flexible computer software for presentation of tabular information and graphics as described on Page 4.

CONTINUOUS VOLUMETRIC METHOD. Isotherms are generated by up to 2000 data points for superior data resolution. The technique used to determine these isotherms (U.S. Patent No. 4,489,593) is different from competitive methods. In the Model 100CX, adsorbate gas is introduced to the sample continuously through a mass flow controller. Sample temperature is maintained from liquid nitrogen temperatures to 450°C, depending on the experiment. The rate of gas flow is maintained constant (better than 1%) throughout the experiment. The volume adsorbed or chemisorbed is calculated by integrating the flow rate over time, and subtracting the dead volume (manifold, holder, and sample volumes) which is determined by using helium.

STATIC VOLUMETRIC MODE. The unique adsorbate flow control features of the Model 100CX also enables the user to perform conventional Static Volumetric experiments. The mass flow controller can be programmed to provide virtually unlimited volume and equilibration time adjustment. No hardware or software changes are required.

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